REMARKS

This document is filed in reply to the non-final Office Action dated June 30, 2008 ("Office Action"). At the Examiner's suggestion, Applicants have amended page 6 in the Specification to insert three sequence identifiers. Claim 1 has been amended to more distinctly claim the invention. Support for the amendment can be found in the specification at page 2, last paragraph and page 15, lines 17-20.[1] No new matter is introduced.

Upon entry of the proposed amendments, claims 1-3, 5-10, 12-17, and 19-29 will be pending. Claims 5 and 12 are allowed. Claims 1, 8, and 29 are under examination. Applicants respectfully request that the Examiner reconsider this application in view of the following remarks.

Objection to Specification

The Examiner objected to the Specification for missing sequence identifiers in two paragraphs at page 6. See the Office Action, pages 2-3, carryover paragraph. At the Examiner's suggestion, Applicants have amended the two paragraphs to insert three sequence identifiers. Applicants would like to point out that sequences represented by the three identifiers were presented with the response filed July 26, 2006. In view of the above remarks, it is requested that the objection be withdrawn.

35 U.S.C. § 103 Rejections

Claims 1, 8, and 29 were rejected as obvious over Schimming *et al.* Eur. J. Biochem. 204, 13-19(1992) ("Schimming"). See the Office Action, page 4, paragraph 2. Applicants have amended claim 1 and will discuss this claim first.

Claim 1 is drawn to an isolated polypeptide having the enzymatic catalytic domains of a wild type 1,3-1,4-β-D-glucanase sequence (SEQ ID NO: 1) and excluding the carboxyl terminal 78 amino acid residues of SEQ ID NO: 1. The polypeptide has a

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[1] The passage at page 2 describes "two catalytic domains, i.e., domains A (aa 28-202, SEQ ID NO: 3) and B (aa 203-266, SEQ ID NO: 4)"; the passage at page 15 describes that "[a]ll of the features disclosed in this specification may be combined in any combination. Each feature disclosed in this specification may be replaced by an alternative feature serving the same, equivalent, or similar purpose." In other words, one of the two domains contains SEQ ID NO: 3 or SEQ ID NO: 4.

higher enzymatic activity than the wild type 1,3-1,4-β-D-glucanase and one of the catalytic domains includes the sequence of SEQ ID NO: 3 or 4.

Referring to Figures 4 and 5 of Schimming, the Examiner asserted that "Schimming ... discloses a wild type 1,3-1,4-β-D-glucanase from *Fibrobacter succinogenes* ... [and] that said glucanase may have two catalytic domains, comprising of amino acid 28-89 and 90-251." Then, he concluded that "it would have been obvious to one having ordinary skill in the art ... to make a fragment consisting of only the two catalytic domains ... or systematically delete amino acid residues at the C-terminal region of the 1,3-1,4-β-D-glucanase..." See the Office Action, page 5, line 10 through page 6, line 9.

Applicants note that the two sequences "amino acid 28-89 and 90-251" referred to by the Examiner are sequences in a 1,3-1,4-β-D-glucanase from "Ctc, [i.e.,] *C. thermocellum*." See Schimming, Fig 4 and the first line of the caption for Fig. 4, emphases added. In other words, contrary to the Examiner's assertion, these two sequences are not from a wild type 1,3-1,4-β-D-glucanase from *Fibrobacter succinogenes*. Indeed, the above-mentioned two sequences do not even appear in the sequence of SEQ ID NO: 1 as recited in claim 1 and therefore differ from SEQ ID NO: 3 or 4 as recited in claim 1. Thus, Applicants submit that there cannot be a *prima facie* case of obviousness against claim 1.

Even if there were a *prima facie* case (which the Applicants do not concede), it can be successfully rebutted a showing of an unexpected property of the claimed polypeptide over the closest prior art. Applicants would like to bring to the Examiner's attention that "[e]vidence showing that the claimed [invention] was more effective than the closest prior art ... was sufficient to overcome the rejection under 35 U.S.C. 103 (emphases added)." See MPEP 716.02(a)II, citing *In re Chupp*, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987).

As acknowledged by the Examiner, "Schimming *et al.* has not isolated a fragment consisting of only the catalytic domain." See the Office Action, page 4, lines 18-19. In this connection, Applicants submit that the "closest prior art" were the mutants described

in Teather *et al.* (Teather) , which the Examiner cited in the previous office action dated December 31, 2007. Accordingly, Applicants will address the unexpected property of the claimed polypeptide over the mutants described in Teather.

Teather describes three *F.* succinogenes 1,3-1,4-β-D-glucanase mutants. One of them was encoded by a nucleic acid having a "[d]eletion of the carboxy-terminal region up to and including base 923." See page 3838, right column, lines 51-64. The mutant contained aa 1-398 (encoded by nt 0-923) and lacked only the carboxy-terminal 41 amino acids of the total 349 amino acids. See FIG 1. This mutant had "about 0.16% of the original value" of the wild type enzyme activity. In other words, it lost more than 99.8% of the activity and its activity was lower than that of the wild type by 625 fold. See page 3838, line 54. The other two mutants had even lower activity. In fact, they retained only "residue activity, 0.01%," or "no detectable enzyme activity." See, page 3838, right column, lines 51-60. In sum, all of the three mutants have enzymatic activities substantially lower than that of the wild type 1,3-1,4-β-D-glucanase.

In contrast, the polypeptide of claim 1 unexpectedly has "a higher enzymatic activity than the wild type 1,3-1,4-β -D-glucanase." See also the Specification, page 1, lines 17-19, and pages 10-11, Table 1.[2] This higher enzymatic activity was unexpected, as it could not be predicted by the Schimming reference, alone or combined with other references such as Teather. Thus, the above-discussed unexpected property successfully rebutted the obviousness rejection and claim 1 is non-obvious.

The Examiner asserted that "[t]he property of having higher enzymatic activity compared to the wild type enzyme would flow naturally" from the teaching of Schimming and "therefore said property is inherent." See the Office Action, page 6, lines 16-19.

Applicants disagree. As just discussed, the three mutants described in Teather had substantially lower "enzymatic activity compared to the wild type enzyme." It follows that, contrary to the Examiner's assertion, "[t]he property of having higher

[2] As pointed out in MPEP 2145, "[r]ebuttal evidence and arguments can be presented in the specification, *In re Soni*, 54 F.3d 746, 750, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995), by counsel, *In re Chu*, 66 F.3d 292, 299, 36 USPQ2d 1089, 1094-95 (Fed. Cir. 1995)"

enzymatic activity compared to the wild type enzyme" does not "flow naturally" from the teaching of Schimming.

For the reasons and facts set forth above, Applicants submit that claim 1 is not obvious over Schimming. Claims 8 and 29 depend from claim 1. For at least the same reason, they are also not obvious.

Allowable Subject Matter

Claims 5 and 12 are allowed. See the Office Action, page 6, line 3.

Conclusion

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Please apply any other charges or credits to Deposit Account No. 50-4189, referencing Attorney Docket No. 70002-111001.

Respectfully submitted,

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